

A NEW *BOERHAVIA* (NYCTAGINACEAE) FROM SONORA, MEXICO

RICHARD SPELLENBERG

Department of Biology, New Mexico State University, Las Cruces,
NM 88003-8001

ABSTRACT

Boerhavia traubae (Nyctaginaceae: Nyctagineae; Nyctagininae) is described as a new species from Municipio de Yécora, Sonora, Mexico, in the immediate vicinity of the village of Yécora. It is restricted to mudflow deposits probably of late Miocene age. This delicate annual is distinguished from other species of *Boerhavia* by its small size, its persistent small bracts that are glabrous except for minute marginal trichomes, its few-flowered subumbellate inflorescences, and by its smooth clavate fruit with sharply acute ridges. It is estimated to be most closely related to *B. purpurascens* A. Gray and *B. wrightii* A. Gray.

RESUMEN

Boerhavia traubae (Nyctaginaceae: Nyctagineae; Nyctagininae) es descrita como una especie nueva de Sonora, México. Esta especie se encuentra en el municipio de Yécora, en los alrededores del pueblo de Yécora. Se encuentra restringida a los depósitos de lodolita del Mioceno o mas tarde. Esta anual delicada se distingue de otras especies de *Boerhavia* por su tamaño pequeño, sus brácteas pequeñas, persistentes y glabras excepto por tricomas diminutos en los márgenes, sus inflorescencias subumbeladas con pocas flores y por sus frutos clavados y lisos, con costillas prominentes agudas. Se estima que los relativos más cercanos de esta especie son *B. purpurascens* A. Gray y *B. wrightii* A. Gray.

Recent general collecting activities by Dr. Tom Van Devender, his wife, Ms. Ana Lilia Reina G., and their associates, toward the production of a flora of the Municipio de Yécora, in east central Sonora, Mexico, very near the Chihuahua border, have resulted in the discovery of several new plants. Specimens from the Yécora area, a botanically poorly known region, have provided holotypes or paratypes for 27 taxa since 1987, 16 since Dr. Van Devender and Ms. Reina began their study of the Yécora flora in 1995. Two such new taxa were the annual Asteraceae, *Pectis vandevenderi* B. L. Turner and *Tridax yecorana* B. L. Turner, associates of the distinct *Boerhavia*, here described. Herbaria abbreviations used in this paper follow Holmgren et al. (1990).

***Boerhavia traubae* Spellenb., sp. nov. (Fig. 1) —**

Type: SONORA, Mpio. de Yécora, 1.6 km E of Yécora on Mex. Hwy. 16 at KM marker 281.5, 28°22.30'N, 108°54.71'W, elev. 1645 m, 15 Aug 1998, *Spellenberg, Brouillet & Todsén 12597* (holotype: NMC; isotypes: ARIZ, CIIDIR, ENCB, IEB, MEXU, MT, NY, USON). Paratypes: SONORA, all Mpio. de Yécora: vicinity of cabañas on old road to Maycoba, 0.5 mi E of Arroyo Yécora, 28°23.5'N, 108°54.5'W, elev. 1550 m, 7 Sep 1995, *M. Fishbein et al. 2479* (ARIZ, MEXU, NMC); along westward extension of Avenida Juarez ca. 0.5 km W of ceme-

tery, 28°22.50'N, 108°56.38'W, elev. 1645 m, 15 Aug 1998, *R. Spellenberg et al. 12596* (ASU, F, IEB, NMC, TEX); NW of cemetery in Yécora, 28°22'40"N, 108°56'W', elev. 1540 m, 2 Sep 1997, *W. Trauba s.n.* (NMC); 1.9 km SSW of Las Viboras on Mex. 16 on road to Trigo Moreno, 28°21'50"N, 108°49'34"W, elev. 1620 m, 17 Aug 1998, *T. Van Devender et al. 98-991* (ARIZ, ASU, CIIDIR, ENCB, MEXU, NMC, UC, USON); ca. 2 km NW of Yécora on old road to Santa Rosa, 28°22'45"N, 108°50'45"W, elev. 1560 m, 5 Sep 1996, *J. F. Wiens et al. 96-109* (NMC).

Herba annua tenella; caules 1–3, 10–30 cm alti patenter villosi; folia petiolata sursum parvescentia in caulibus, pro parte maxima in plantae tertia parte inferiore locata, folia inferiora petiolis 3–7 mm longis, laminis ovalibus vel oblongis, 5–16 mm longis, 4–9 mm latis; inflorescentia glabra ramis in fasciculos subbellatos 1–5-florales terminantibus; bractae florales 1–1.5 mm longae, late lanceolatae glabrae marginibus ciliatis; perianthum 2 mm longum super ovarium, 3.5 mm latum, pallide roseum; fructus clavatus, 2.5–2.8 mm longus, glaber laevis, aristis 5 acutis, ad basem sulcis quasi aequilatis.

Plants delicate annuals 10–30 cm tall, with 1–3 stems; *stems* with minute, bent white flat hairs near base, these becoming mixed with dense spreading

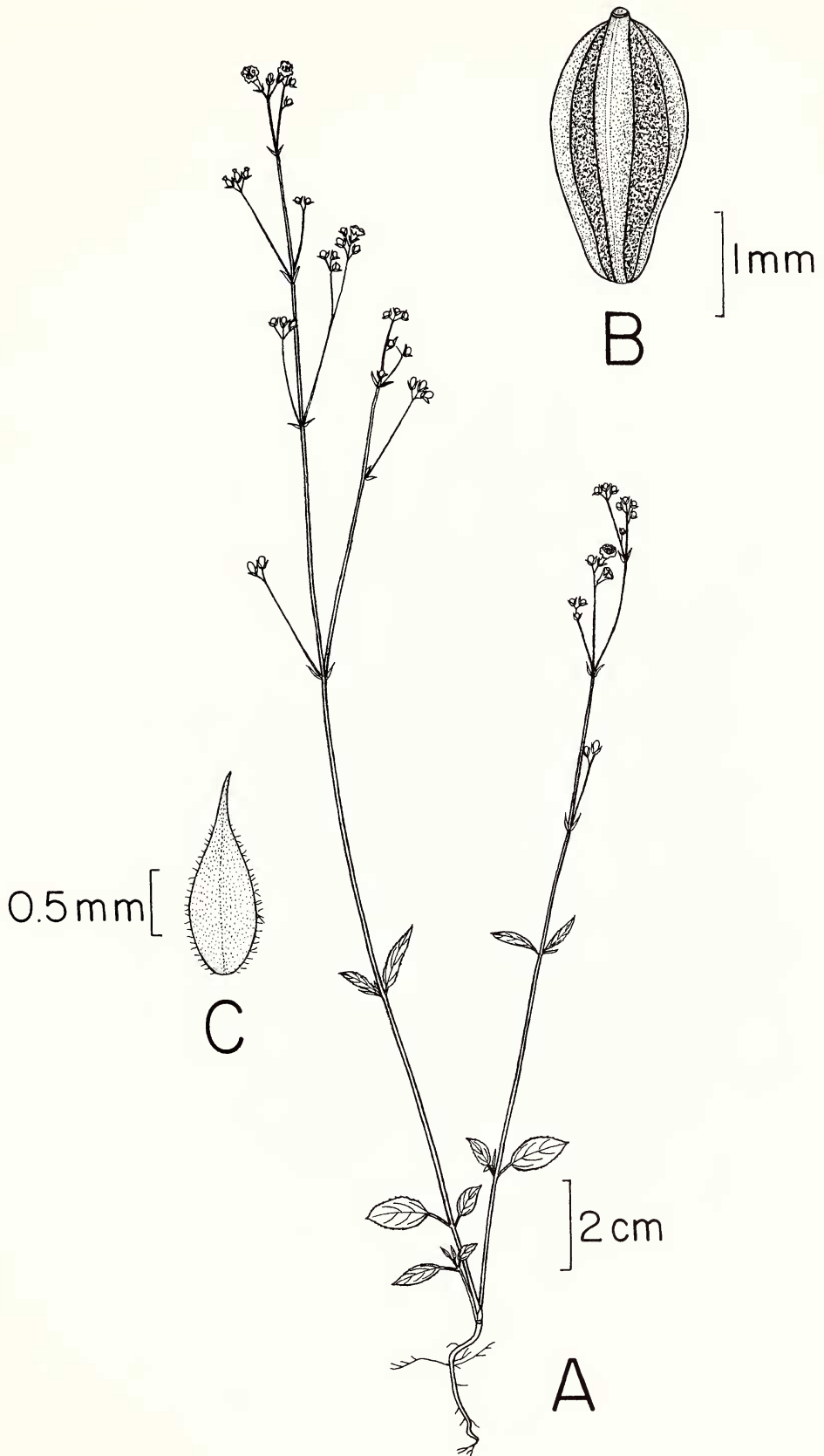


TABLE 1. COMPARISON OF FEATURES OF *BOERHAVIA PURPURASCENS*, *B. TRAUBAE*, AND *B. WRIGHTII*.

Character	<i>B. purpurascens</i>	<i>B. traubae</i>	<i>B. wrightii</i>
Stem pubescence near base of plant	Moderately pubescent with tack-shaped glandular hairs and with bent eglandular hairs	Few scattered tack-shaped glandular hairs; scattered minute bent eglandular hairs	Dense tack-shaped glandular hairs, often with spreading eglandular hairs, and with bent eglandular hairs
Pubescence on branches of inflorescence	Glabrous, or puberulent with bent hairs, or pubescent with tack-shaped glandular hairs and with bent hairs	Glabrous	Dense with tack-shaped glandular hairs and with bent hairs
Terminal clusters in inflorescence	Capitate, branches joining very near to same point	If >2 flowers, branches not all joining at same place	Racemose
Number of flowers per cluster	2-7	1-5	6-22
Bract length, mm	2.5-3.5	1.1-1.5	1.8-3.0
Ratio: bract length to fruit length	0.9-1.2	0.3-0.5	0.5-1.5
Bract pubescence	Glabrous or shaggy hairs on back; shaggy hairs on margin	Glabrous, or with few, small marginal hairs	Glabrous or few shaggy hairs on back; shaggy hairs on margin
Fruit length, mm	2.7-2.8	2.5-2.8	2.2-2.5
Number angles on fruit	5	5	4 (5)
Sulcus shape and sculpturing	Deeply concave; surface appearing pebbled; lightly rugose	Deeply concave, surface smooth; few low wrinkles	Shallowly "V" shaped or almost flat; prominently cross-rugose

brownish gland-tipped hairs beneath inflorescence, all pubescence decreasing within the inflorescence; leaves opposite, petiolate, few and mostly in the basal 1/3 of the plant, blades glabrous, petioles with a scattering of minute white hairs as on the stem, margins minutely crisped; leaves near base of plant with very slender petioles 3-7 mm long, the blades oval or oblong, reddish beneath, 5-16 mm long, 4-9 mm wide, more distal leaves rapidly decreasing in size, the petioles 1-3 mm long, the blades lanceolate, oblanceolate, or oblong, 8-20 mm long, 2-6 mm wide, the tip round or blunt, the leaves at the base of the inflorescence on petioles about 0.5-1 mm long, the blades linear, up to 12 mm long; *inflorescence* 1/2 or more the height of the plant, with a well-defined main axis, at most nodes with either 1 or 2 finer, short, strongly ascending branches terminating in compact subumbellate clusters of 1-5 flowers; *bracts* 1-3 beneath each flower, persistent into fruit, 1-1.5 mm long, broadly lanceolate, attenuate, glabrous except for minute cilia on margin; perianth above ovary broadly funnellform, pale pink, with reddish bands between the lobes, ca. 2 mm long, 3.5 mm broad, 5-lobed, the lobes emarginate; *stamens* exerted, 3-3.5 mm long, filaments pink, anthers pale yellow, ca. 0.5 mm long; *style* exerted to about the same length as the anthers; *fruit* 2.5-2.8 mm long, clavate, 5-angled, glabrous, angles forming narrow ribs about as high as broad, narrowly acute along the edge, the sulci concave, the sulcus surface smooth except for slight wrinkling.

Boerhavia traubae is named for one of the collectors of the species, Reverend William Trauba of the Capuchin order of Franciscan monks. At the time of our collection he was at the Iglesia de Nuestra Señora de Guadalupe in Yécora. Reverend Trauba is an avid collector of native plants within his area of responsibility, and has been of invaluable assistance to the efforts of Van Devender, Reina, and associates toward the production of a flora of the Municipio de Yécora. Personally, I am grateful for the wonderful hospitality of Rev. Trauba and his associates during my stay with the Van Devender-Reina entourage at the monastery in Yécora.

Boerhavia traubae is known to occur only on thin, gravelly soil pockets of exposed igneous outcrops of gently rolling conglomerate mudflow, among oaks, pines, and junipers at 1500-1700 m elevation, restricted to a few kilometers from the village of Yécora (the most distant known site is 9.2 air km E of Yecora, *Van Devender et al.* 98-991). These mudflows are estimated to be mid- to late Miocene in age, or younger (Reina G. et. al., 1999). From this unusual a habitat a number of other annuals and succulent perennials new to science have also been recently discovered, such as the *Pectis* and *Tridax* mentioned in the introductory paragraph.

Boerhavia traubae is a diminutive member of the section *Spicatae* as delimited by Heimerl (1934), a group of four to six species of arid-land annuals restricted to southwestern North America and western South America, the most common of which is

B. spicata Choisy (*sensu lato*). With its persistent bracts and its sharp ridges on the fruit, the *B. traubae* seems most closely related to *Boerhavia purpurascens* A. Gray, a species known to occur within 30 km to the WSW of Yécora in Sonora near La Concepción and 35 km to the WNW at Tepoca. Within the region *B. purpurascens* occurs at lower elevations (200–650 m) than *B. traubae* (1550–1650 m). From Sonora, *B. purpurascens* extends northward into southeastern Arizona and southwestern New Mexico at higher elevations, also occurring in open areas, but usually on deeper sandy or gravelly soils. The fruit of *B. purpurascens* is generally similar, slightly larger, and with a prominent granular appearance to the surface of the sulci. The similarity is sufficient that plants of *B. traubae* were first identified by me as diminutive *B. purpurascens* using Kearney and Peebles (1960), Standley (1918), and Wiggins (1964). Because of my earlier misidentification the collection *Fishbein et al.* 2479 was published as *B. purpurascens* in Martin et al. (1998). *Boerhavia wrightii* A. Gray also has persistent bracts, but has different fruit and inflorescence structure. The three species are distinguished in Table 1.

ACKNOWLEDGMENTS

I thank Dr. Jerzy Rzedowski for assistance with the Latin description, Dr. John Strother and Dr. Alan Smith with the structure of the specific epithet, Mr. Rogelio Cardenas for the fine illustration, and Dr. Tom Van Devender and his wife, Ms. Ana Lilia Reina G., for assisting our efforts while collecting this novel species and for providing follow-up information. Ms. Reina also provided valued assistance with the Spanish abstract. Luis Alberto Pérez Al-

varado, a student of *Boerhavia* in México, provided valuable comments in discussion of the new species, and kindly allowed access to types of Mexican *Boerhavia* species borrowed from major herbaria in the United States on loan to ENCB.

LITERATURE CITED

- HEIMERL, A. 1934. Nyctaginaceae in A. Engler and H. Prantl (eds.), *Die natürlichen pflanzenfamilien*, 2nd ed., 16c:86–134.
- HOLMGREN, P. K., N. H. HOLMGREN, AND L. C. BARNETT. 1990. *Index herbariorum*, part 1: The herbaria of the world, 8th ed. *Regnum Vegetabile* 120:1–693.
- KEARNEY, T. H., AND R. H. PEEBLES. 1960. *Arizona flora*, 2nd ed., with supplement, 3rd printing. University of California Press, Berkeley.
- MARTIN, P. S., D. YETMAN, M. FISHBEIN, P. JENKINS, T. R. VAN DEVENDER, AND R. K. WILSON. 1998. *Gentry's Río Mayo Plants—The tropical deciduous forest and environs of northwest Mexico*. University of Arizona Press, Tucson.
- REINA G., A. L., T. R. VAN DEVENDER, W. TRAUBA, AND A. BÚRQUEZ M. 1999. Caminos de Yécora. Notes on the vegetation and flora of Yécora, Sonora. Pp. 137–144 in Q. B. D. Vasquez del Castillo, M. C. M. Ortega N., and C. P. C. A. Yocupicio C. (eds.), *Memorias: Symposium internacional sobre la utilizacion y aprovechamiento de la flora Silvestre de zonas aridas*. Depto. de Investigaciones Cientificas y Tecnologicas, Academia de Recursos naturales Terrestres, Universidad de Sonora.
- STANDLEY, P. C. 1918. *Allioniaceae*. *North American flora*, Vol. 21:171–254, New York Botanical Garden, Bronx.
- WIGGINS, I. L. 1964. *Flora of the Sonoran Desert*, pt. II. Pp. 189–1740 in F. Shreve and I. L. Wiggins (eds.), *Vegetation and flora of the Sonoran Desert*, 2 vols. Stanford University Press, Stanford, CA.